Introduction to UV CURING RESIN

1. UV-curable resins with excellent molding processability
2. UV-curable resins with excellent substrate adhesion

Sanyo Chemical

1. UV-curable resins with excellent molding processability

An introduction

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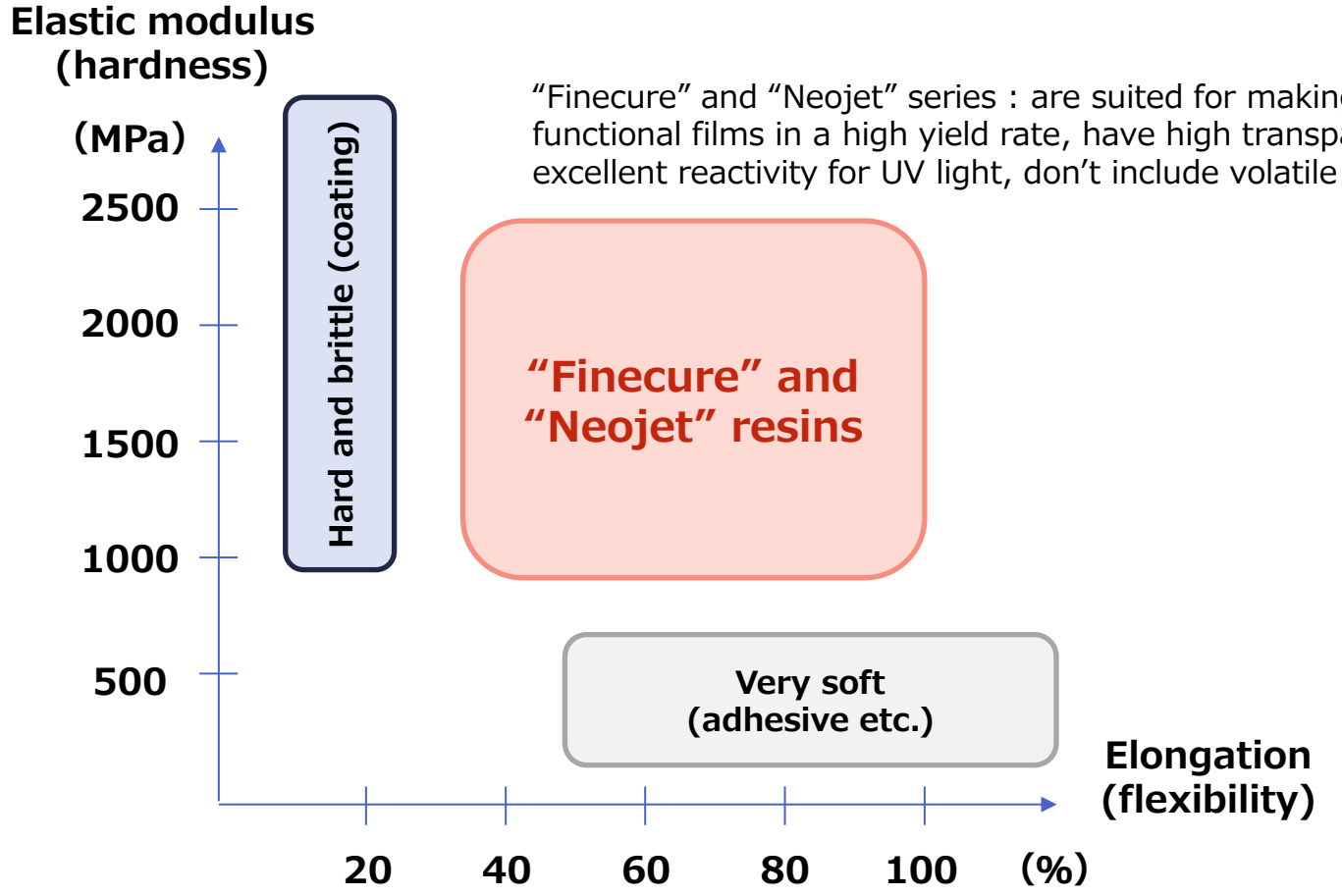
Most conventional UV-resins are brittle and easily broken, but “Finecure” and “Neojet” resins show superior toughness and elasticity in comparison to the conventional resins.



1. UV-curable resins with excellent molding processability

Applications

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"Finecure" and "Neojet" series are suited for making various functional films in a high yield rate.

e.g.
- Optical film
- Water-repellent film
- Resin parts for automotive
- UV coating of building material

Optical films
(TV, tablet etc.)

Water-repellent films
(Bathroom mirror, surveillance camera lens etc.)

1. UV-curable resins with excellent molding processability

Properties

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Properties			Finecure TS-01	Finecure TS-02	Neojet FL
Properties of resin before curing		Content of UV curable resin (%)	100	100	100
		Viscosity（mPa･s)	2,200	4,200	17
After curing	Mechanical properties	Tensile elastic modulus (MPa)	2,000	1,200	1,800
		Breaking elongation (%)	22	45	75
		Tg(℃)	57	52	77
	Optical properties	Total light transmittance (%)	91	90	90
		Haze (%)	0.3	0.2	0.6
		Refractive index	1.56	1.57	1.53
	Adhesiveness for substrate	Easy adhesive PET	○	○	○
		PC		○	○
		TAC			○
		Glass			○

1. UV-curable resins with excellent molding processability Properties

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<UV curable resin evaluation method>

Evaluation sample shape

- For measuring tensile elastic modulus and breaking elongation:
  Dumbbell No. 3 (film thickness: 500 μm)
- For Tg measurement:
  Strip shape (width 5 mm, length 40 mm, film thickness 1 mm)
- For optical characteristic evaluation:
  Apply to easily bonded PET film (Dry film thickness: 10 μm)
- For base material adhesion evaluation:
  Apply to various base materials (Dry film thickness: 10 μm)

UV curing conditions

- Light source: Electrodeless UV lamp (D bulb)
- UV irradiation conditions: 320mW / ㎠, 1,000mJ / ㎠

1. UV-curable resins with excellent molding processability

Properties

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Evaluation method

- Viscosity:
  Cone plate type (E type) viscometer (25℃)
- Tension elastic modulus and Break elongation:
  Measured by autograph according to JIS K 6251
- Tg:
  Dynamic viscoelasticity measurement (DMA)
- Total light transmittance and Haze:
  Haze meter (manufactured by BYKGardner)
- Refractive index:
  Abbe refractometer (manufactured by ATAGO)
- Adhesion to substrate materials :
  Evaluated by a grid tape test according to JIS K 5600

1. UV-curable resins with excellent molding processability

Properties

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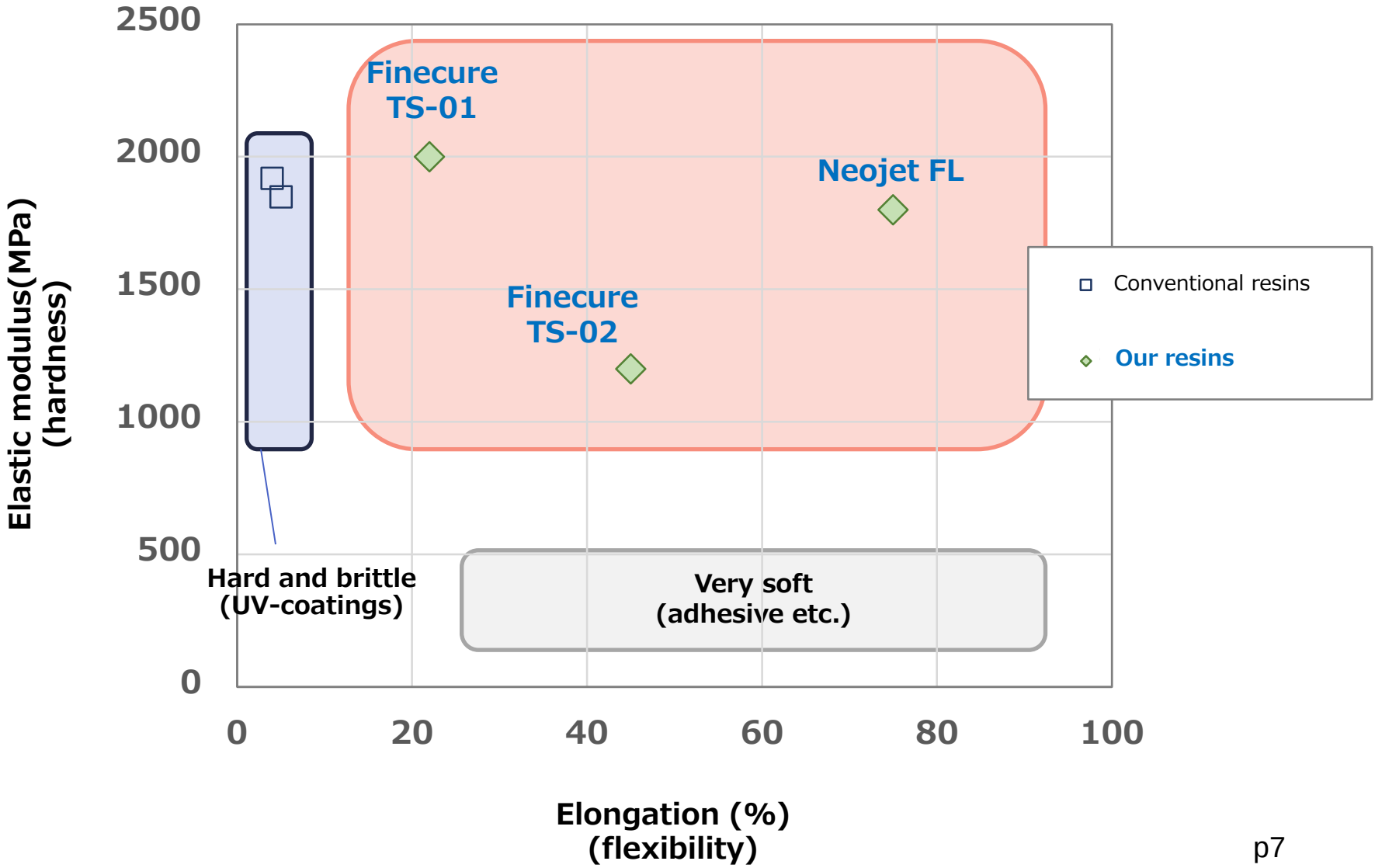

2. UV-curable resins with excellent substrate adhesion

An introduction

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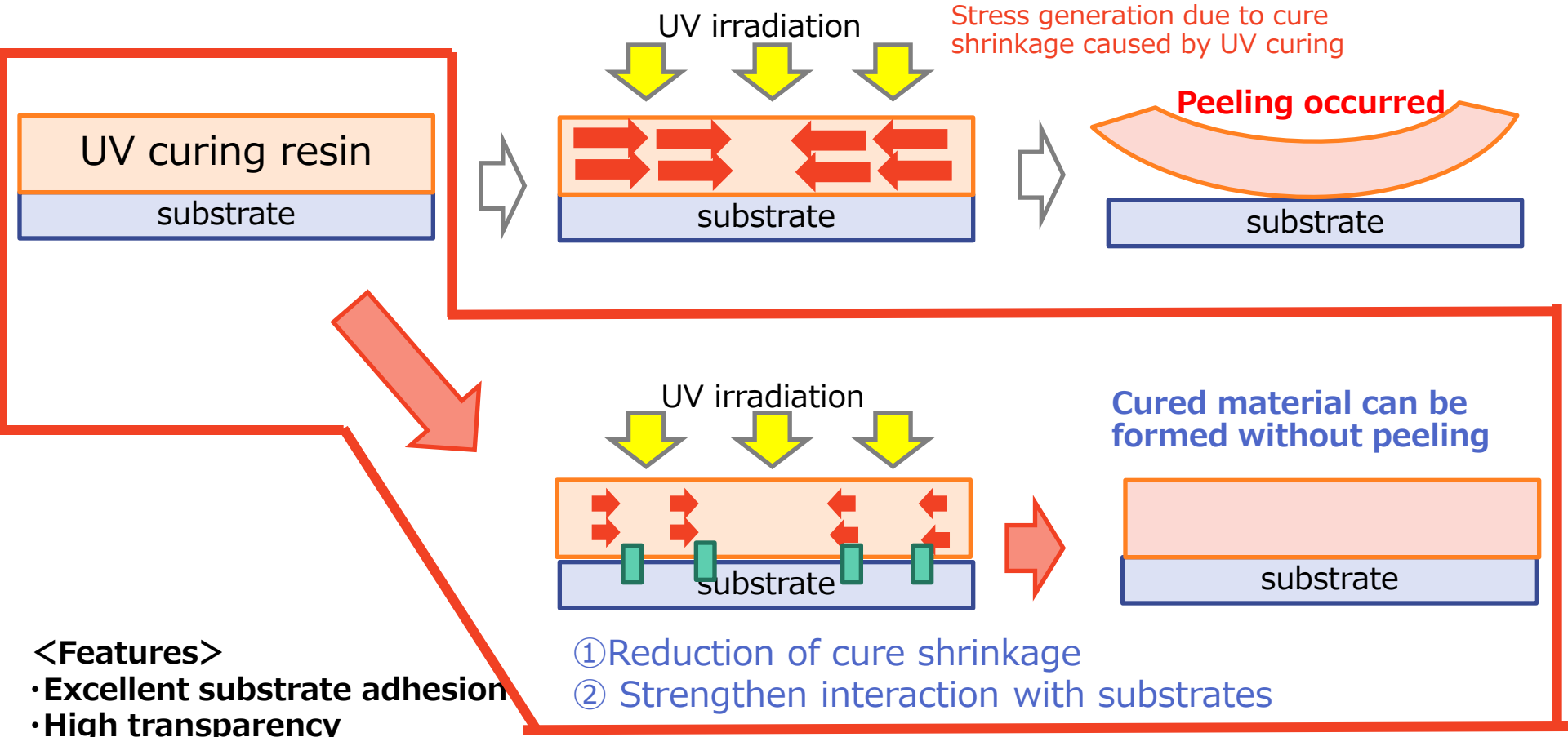
It is a UV-curable resin with high substrate adhesion that reduces the "deterioration of adhesiveness due to cure shrinkage during light curing," which is an issue with UV-curable resins.
It is a UV-curable resin with high substrate adhesion.



<Features>
- **Excellent substrate adhesion**
- **High transparency**
- **Rapid curing property**
- **No solvents**

2. UV-curable resins with excellent substrate adhesion
Applications

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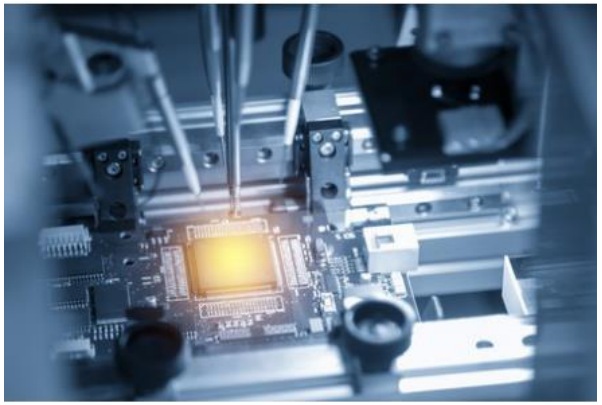
<Application examples>

・Primer treatment for various base materials (PP, glass, metal, etc.)
・Protection of metal wiring such as copper wiring and silver wiring (inkjet coating, photoresists)
・Insulating film formation for displays (touch panels, OLED, etc.)
・Formation of rewiring layers and interlayer insulation layers for electronic components (semiconductor packages, interposers, MEMS, CMOS sensors, etc.)



2. UV-curable resins with excellent substrate adhesion Properties

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Properties			Neojet PAD	Neojet PMAD	Finecure FOC
Features			Plastic adhesion	Glass, metal adhesion	Negative photo resist Glass, metal adhesion
Properties of resin before curing		Content of UV curable resin（%）	100%	100%	20～40% (solvent : PGMEA)
		Viscosity (mPa･s)	5	17	10～100
After curing	Adhesion to substrate	Easy adhesive PET	◎	○	
		PP	◎		
		PC	◎	○	
		TAC	◎	○	
		glass		◎	◎
		copper		◎	◎
	Electrical Properties	migration	-	-	None (130℃85%200hr) (L/S=10/10μm)
		Insulation resistance value	-	-	5.0E+11Ω (130℃85%200hr) (L/S=10/10μm)
	Optical properties	total light transmittance(%)	90	90	90
		Haze(%)	0.5	0.4	0.5
		Refractive indexnd25	1.53	1.53	1.53

2. UV-curable resins with excellent substrate adhesion Properties

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<UV curable resin evaluation method>

Evaluation sample shape

・For evaluation of optical characteristics:

Apply to PET (Dry film thickness: 10 μm)

・For evaluation of adhesion to base material:

Apply to various base materials (Dry film thickness: 10 μm)

UV curing conditions

・Neojet GMAD、PAD

Light source : LED 385nm

UV irradiation conditions : 1W/cm^2、2000mJ

・Finecure FOC

Light source : high-pressure mercury lamp

UV irradiation conditions : 20mW/cm^2、100mJ

2. UV-curable resins with excellent substrate adhesion Properties

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＜Evaluation method＞

・Viscosity: Cone plate type (E type) viscometer (25 ° C)

・Tension elastic modulus and Break elongation:

Measured by autograph according to JIS K 6251

・Tg: Dynamic viscoelasticity measurement (DMA)

・Total light transmittance・Haze:

Haze meter (manufactured by BYKGardner)

・Refractive index: Abbe refractometer (manufactured by ATAGO)

・Base material adhesion:

Evaluated by a grid tape test according to JIS K 5600

2. UV-curable resins with excellent substrate adhesion Properties

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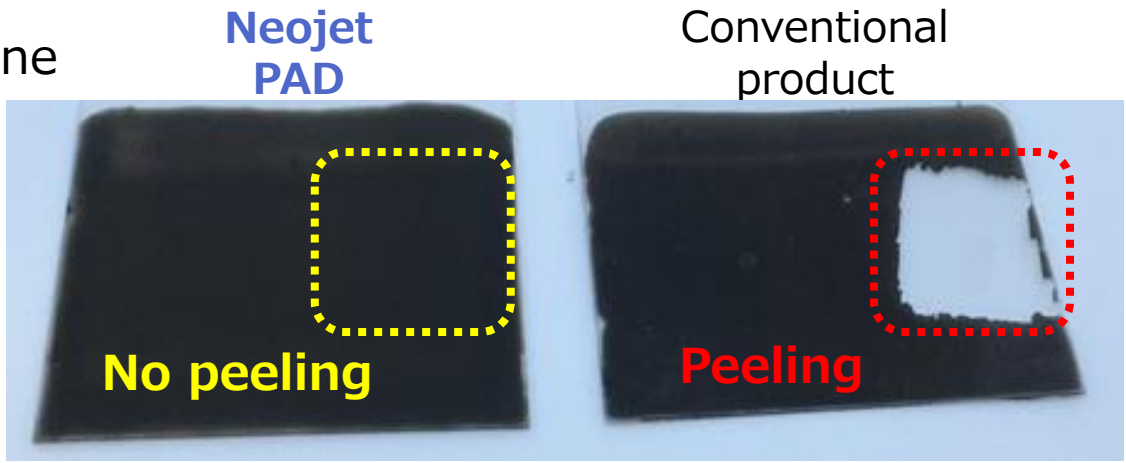
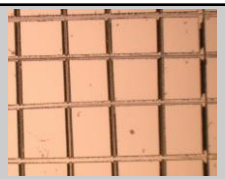
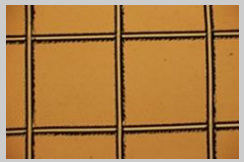
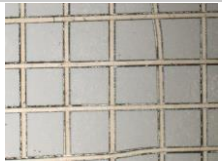
<Neojet PAD>

Good adhesion to polypropylene



<Neojet GMAD、Finecure FOC>

Good adhesion to inorganic substrates such as copper, ITO, glass, etc.

substrate	Neojet GMAD	Finecure FOC
copper		
ITO		
glass